

**The Tendencies of Smart Device Users Towards Technological Marketing Innovations;
Mediator Role of Perceived Usefulness on the Relation Between Perceived Ease of Use and
Attitude Towards Using¹**

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Abstract

Technology, originating from the earliest stages of human history and continually evolving, encompasses the development and improvement of tools, devices, and systems. Technologies are designed to aid human activities and enhance the quality of life. Smart devices stand out as some of the most impactful technological innovations in use today. These internet-connected devices enable seamless data exchange and offer solutions to numerous human challenges. While many consumers embrace the advantages provided by these innovations, others approach them with caution, viewing them as potential sources of problems and, therefore, resisting their adoption. This article aims to investigate how factors such as optimism, innovativeness, discomfort, insecurity, perceived usefulness, and ease of use influence smart device users' attitudes toward using new technological innovations. A questionnaire using a 5-point Likert scale was distributed to smart device users over the age of 18 in Istanbul. The SPSS and Process Macro (Hayes) programs are used in the research to test the hypotheses. The empirical findings from the research section of this article indicate that technology readiness and its dimensions (optimism and innovativeness) positively and significantly effect perceived ease of use and perceived usefulness, whereas insecurity has a negative and significant effect. Both perceived ease of use and perceived usefulness positively and significantly effect attitude towards using. Furthermore, it was found that perceived usefulness acts as a partial mediator in the relationship between perceived ease of use and the attitude towards using new technologies.

Keywords: Smart Devices, Marketing Innovation, Perceived Usefulness, Perceived Ease of Use, Attitude Toward Using

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Introduction

Businesses apply technological innovation to secure competitive advantages in rapidly evolving market conditions, differentiate themselves, attract consumer preferences, and enhance profitability. Despite all the benefits that technology offers, each new innovation means change and is hard to adapt for many people. Consumers' resistance to new technologies could result in failures and financial losses for business. Resistance could manifest itself in the form of delayed purchases, reluctance to use new goods and services, refusal to recommend, or even active boycotts. Besides that, many of these innovation efforts come with substantial costs, such as high capital investments. As a result, while technological innovation creates tremendous opportunities, it also presents tremendous challenges and risks for businesses.

Consumer resistance to technology can hinder businesses from achieving their goals and result in wasted investments. Therefore, businesses aim to understand the factors influencing consumers' decisions to accept or reject technological innovations. In this context, businesses investigate the factors affecting attitudes towards using new innovations while also working to mitigate negative impacts and encourage product adoption, enhancing loyalty to the product and brand through innovative marketing strategies.

In recent times, a wealth of research has been focused on technology acceptance and resistance. A large number of these studies examine the factors that positively or negatively influence consumers' attitudes and intentions toward using technology. This article aims to identify and examine the factors influencing smart device users' attitude toward technological marketing innovations, considering both positive and negative aspects, and highlighting the roles of perceived usefulness and ease of use.

Literature Review

Smart Devices

Technology is an important concept that has shaped human life directly and indirectly throughout the ages (Güvenç, 2004). The first technological advances took place during the Stone Age when humans first started producing their tools and implements necessary for basic activities like hunting, self-defense against wild animals, and survival in harsh environmental conditions (İnam, 2004). Fire, the wheel, money, the compass, the printing press, the internal combustion engine, the steam engine, electricity, television, computers, the internet, smart devices, and artificial intelligence are some of the most revolutionary technological inventions that shaped the world. These inventions served as a foundation for other ideas to be invented. For instance, the internal combustion engine gave birth to automobiles and aircraft, while the steam engine revolutionized the architecture of ships. (Davenport, 2019).

One of the most important technological advancements today is smart devices. Systems equipped with computer-supported hardware that require no human intervention are referred to as smart (Gökozan and Taştan, 2018). Smart devices are those that, among other features, can connect to the internet, exchange data, increase speed, save time, and provide solutions that make life easier

(Alpaslan and Delibalta, 2018). With technological advancements, the use of smart devices has become increasingly widespread, now being utilized by billions of end users (Arabo et al., 2012).

When thinking of smart devices, smartphones, smartwatches, tablets, smart glasses, and smart bracelets are among the first that come to mind. These devices offer a range of functionalities, including making phone calls, sending messages, taking photos and videos, listening to music, playing games, sending emails, and accessing the internet (Kopmaz and Arslanoğlu, 2018). Furthermore, smart devices help buyers perform banking transactions, shop online, video conferences, or monitor activities with health parameters such as number of steps walked, heartbeat rate, calories burned, pulse, blood pressure, and blood sugar level. These devices also provide quick navigation to destinations using GPS and direction-finding features (Faye et al., 2015).

A category of smart devices is wearable smart devices. "Wearable" refers to electronic or computer technologies that can be comfortably worn on the body as accessories or clothing. These devices perform functions similar to those of smartphones, tablets, and computers. Wearable smart devices include smartwatches, smart glasses, smart textiles, smart contact lenses, smart bracelets, activity trackers, virtual reality headsets, and head-mounted displays. Today, wearable smart devices have taken an important place in many areas of life such as health, sport, communication, education, transportation, finance, gaming, music, and the military (Sağbaşı et al., 2016).

According to the "Digital in 2023 in Turkey" report by We Are Social, the usage rates of smart devices in Turkey in 2023 were as follows: 97,6% of adults used smart phones. Desktop and laptop computer usage was at 59%, while tablet usage was at 42,7%. The usage rate of wearable smart devices such as smartwatches and smart bracelet were 20.8% (We Are Social & Meltwater, (2023), "Digital 2023 Turkey", Erişim Adresi: <https://www.dijidijital.com/we-are-social-turkiye-dijital-raporu-2023/>).

In future, smart devices will be greatly increased and integrated in each and every field of human life. For example; Smart forks and knives will enable a person to control their eating rate and calorie intake, while smart device-controlled robotic arms allow surgeons to perform operations from kilometers away. Holographic keyboards and 3D smart glasses will enable interacting with the internet through hand gestures, eye movements, or voice. The brain-controlled prosthetics would also provide mobility to the paralyzed individual, while the ingestible nano smart devices would be used for early detection and treatment of diseases (Mesko, 2017).

Marketing Innovation

Philip Kotler (2003) defined marketing as the "customer production department" of businesses. In this context, the primary objective of marketing is to build lasting, mutually beneficial relationships with customers (Kotler, 2003). Effective marketing depends on creating a very positive impression on customers, which raises brand awareness and their potential of buying more products (Akpur and Zengin, 2020). In such competition, companies that correctly identify the needs of their customers, offer innovation that adds value, and put into place marketing strategies effectively obtain a great advantage in comparison with their rivals (Çoban, 2005). Marketing innovation plays a key role in creating value for customers and developing new marketing practices (Gutierrez et al., 2019).

Marketing innovation encompasses all aspects of a business and involves the adoption of new and effective marketing methods. According to the Oslo Manual, it includes substantial and innovative changes in product design, packaging, placement, promotion, pricing, and advertising (Oslo, 2005). Examples of marketing innovations include the use of product placements in movies and television, the use of celebrities as endorsers, the first-time franchising or licensing of a product, membership card discounts, and new store openings (Balaban, 2018).

According to Kim and Mauborgne (1997), marketing innovation can be categorized into three distinct levels: (1) the product level, which pertains to physical products; (2) the service level, encompassing customer service, maintenance support, product guarantees, and training for distributors and retailers; and (3) the delivery level, which includes logistics and distribution channels used to bring the product to the customer. These marketing innovation activities can add value to a business at various levels, influencing its performance and growth rate (Moreira et al., 2012).

From another perspective, Shergill and Nargundkar (2005) distinguish between two types of marketing innovation. The first involves incremental adjustments to elements of the marketing mix (product, price, promotion, distribution) that are not radical. The second type is radical marketing innovation, which involves significant changes to these elements (Shergill and Nargundkar, 2005, pp.8). It also includes the development and implementation of new methods for product design, packaging, pricing, distribution, or promotion (Junge et al., 2012).

In the realm of marketing innovation, companies can design products and services tailored to meet customer needs, wants, and solve problems while offering them at suitable prices. Additionally, businesses may develop new distribution channels to improve customer comfort or make changes to packaging, design, or brand image (Balaban, 2018). The main goal of marketing innovations is to respond promptly to fast-changing customer wants and needs, promote the product efficiently, enter new markets, achieve better positioning of products within existing markets, and, finally, reach high profits due to higher sales (Karlsson and Tavassoli, 2015). Beyond these goals, marketing innovation also offers opportunities to reduce costs, differentiate products from competitors, attract and retain consumers, enhance brand awareness, and strengthen relationships with sellers, fostering greater customer loyalty and attachment (Yavuz, 2010).

The key benefits of marketing innovation are widely exploited by many companies in pursuit of a stronger market position and competitive advantage. Many of them substantially invest in market research, sample testing, and use information obtained in designing new products and packaging (Bloch, 2007). In reality, however, they find significant barriers to innovation in marketing due to limited budget resources, intense price competition, high costs related to regulatory issues, a shortage of skills and qualified staff, and strong competitors with high levels of innovation, R&D, and other skills (Kalay and Kızıldere, 2015). Furthermore, companies that fail to prioritize innovative R&D investments may struggle to keep pace with rapidly advancing technology, fierce competition, and shifting environmental conditions, making it challenging to convert opportunities and threats into advantages and meet evolving customer expectations (Jabbouri and Zahari, 2014).

Here are several examples of marketing innovation practices adopted by companies:

- *L'Oreal*: The augmented reality app “L’Oreal Makeup Genius” was downloaded by over 20 million consumers within a few months. This app allows users to scan L’Oreal product barcodes with their smartphones to preview how the products would look on their faces and skin before making a purchase, and they can share this experience with friends (Forbes, 2016).
- *Apple*: In 1998, Apple introduced the slogan “Think Different” in its advertisements to highlight the technological benefits and potential of its products. The company employed a pricing strategy aimed at the premium market segment, allowing for high profits from its innovative products by targeting consumers willing to pay a premium for the quality and advantages offered by Apple (Shields, 2001; Tien et al., 2019).
- *Huawei*: The rapidly expanding smartphone manufacturer Huawei featured celebrities such as Scarlett Johansson and Lionel Messi in its advertisements to capture global attention and drive sales (IT Network, 2017).
- *GE Healthcare*: To reduce children's fear of MRI machines, GE Healthcare redesigned them to resemble pirate adventure rooms, transforming the machines from intimidating, dark devices into engaging, child-friendly environments (Varadarajan et al., 2017).
- *Mizu Home*: The home accessory company Mizu Home developed smart towels that dry quickly and feature odor and bacteria prevention. Marketed as the softest and most durable towels ever produced, these smart towels change color to alert users when they detect dirt, microbes, or bacteria (Medium, 2017; Mizutowel, 2024).
- *IKEA*: IKEA created an augmented reality mobile app that allows consumers to visualize how products from the IKEA catalog would look in their homes by scanning catalog pages with their smartphones. This app helps users assess the color, size, and compatibility of products with their existing furniture (Küçüksaraç & Sayımer, 2016).
- *Starbucks*: Starbucks expanded its distribution channels to include various “third-party” locations, such as travel spots, shopping centers, and vegetable markets. This strategy allowed customers to enjoy Starbucks coffee even if they were not visiting Starbucks coffee shops, thereby reaching a broader audience (Karamehmet, 2012).
- *Vestel*: Vestel, a leading manufacturer in Turkey’s white goods sector, introduced the first smart built-in oven that can be monitored remotely via a smartphone or tablet (Tekin et al., 2016).

Consumer Reactions to New Technologies

As technology becomes increasingly embedded in various aspects of life, technology-based products and services have become indispensable (Kyutt, 2011). Although these new technological innovations offer benefits that simplify consumers' lives, it is normal for some individuals to initially resist change, as it disrupts their established routines (Laukkanen et al., 2007). Researchs indicate that individual differences such as beliefs, personality, and demographic characteristics can influence consumers' decisions to either accept or reject technology. For example, a consumer's insecurity about

technology can lead to a biased attitude towards new technological innovations, causing them to refuse to use technology-based products and services despite the potential benefits (Lam et al., 2008).

When consumers encounter new technologies, their psychological responses vary based on the emotions these technologies provoke. If consumers feel uncomfortable about the technology or are not ready to use it, they may completely avoid its use. According to Mick and Fournier (1998), consumers' responses to new technologies vary based on eight technology paradoxes that they need to deal with. These technology paradoxes are distinguished as follows:

- Control / Chaos,
- Freedom / Enslavement
- New / Obsolete
- Competence / Incompetence
- Efficiency / Inefficiency
- Fulfills / Creates Needs
- Assimilation / Isolation
- Engaging / Disengaging

These eight paradoxes can evoke either positive emotions (such as enjoyment, perceived usefulness and ease of use) or negative emotions (such as fear, discomfort and insecurity) among consumers towards new technologies. These emotions play a crucial role in whether consumers decide to adopt or reject the technology. Therefore, businesses must carefully evaluate and investigate consumers' readiness and resistance to use new technologies. It's crucial to determine whether these technologies will offer benefits in their daily lives and work (Lin & Hsieh, 2007).

Technology Readiness Model

One of the most significant study measuring consumers' tendencies to adopt and use technology is Parasuraman's Technology Readiness Model (2000). He describes technology readiness as individual's willingness to adopt new technologies to help them achieve their goals in both personal and work settings and to benefit from what technology can offer. He also states that a person holds both positive and negative views on technology, which can be assessed using four different dimensions: optimism, innovativeness, discomfort, and insecurity. Optimism and innovativeness reflect positive emotions and behaviors of consumers toward the adoption and use of new technological products and services, hence showing their acceptance to put up with new technologies. In contrast, discomfort and insecurity represent the negative emotions and behaviors that signal

resistance to accepting new technological products and services. These categories illustrate the various ways in which consumers respond to new technologies (Lin & Hsieh, 2007).

Optimism: Optimism involves a positive attitude in the form of positive expectations towards any situation. It is also generalized as a disposition of personality. Traditionally, optimists have been viewed as those who are high in morale and persistence through difficulties as well as putting substantial effort into achieving goals and often perceiving their outcomes as being favorable (Çağlar, 2013; Yeşil et al., 2016). Optimism, within the usage context of consumer technology adoption, is defined as the general expectation that new technologies will result in an increase in control, flexibility, and efficiency in life. People with an optimistic mindset generally expect favorable outcomes, pay less attention to disadvantages, worry little about risks, and are more open to adopting and using new technologies. This perspective leads them to look at new technologies as friendly and usable, thus harboring no second thoughts toward accepting them (Walczuch et al., 2007).

Innovativeness: Innovativeness is the tendency to be among the first to adopt new technologies, often positioning oneself as a pioneer in technology adoption. Innovative individuals actively follow, research, and gather information about emerging technologies of interest. They are adaptable, open-minded, and fearless in exploring new technologies, often becoming leaders and influencers in the tech industry (Lam et al., 2008). An innovative consumer eagerly awaits the release of new products, queues up to purchase the latest technological advancements, and takes pride in being among the first to experience and endorse these innovations. Such consumers are willing to take risks, including paying premium prices for new products, and their enthusiasm can increase the price of introducing new products to the market (Aydın, 2009).

Because of these characteristics, optimists and innovators are a very crucial target market for businesses that introduce new technological products and services (Sönmez & Akgül, 2015). Parasuraman (2000) suggests that consumers who are either optimistic or innovative show a greater willingness to adopt new technological advancements, even if they experience some level of insecurity or discomfort (Walczuch et al., 2007).

Discomfort: Discomfort arises from the anxiety associated with feeling unable to manage or control new technology (Walczuch et al., 2007). It can also be described as the inability to use technology without assistance or the perception that technological products and services are confusing or difficult to understand (Sönmez & Akgül, 2015). This feeling of discomfort reflects a broader paranoia about technology, where individuals believe it might cause problems and should be completely avoided (Demirci & Ersoy, 2008). Based on such sentiments, people might keep themselves away from technology since it might threaten human control, as dramatically conceptualized by Harlan Ellison in the film "Terminator".

Insecurity: Insecurity is characterized by a lack of confidence in new technologies, driven by concerns about security, privacy, and doubts regarding the technology's proper functioning. Consumers who are inherently insecure and wary about privacy issues may approach technology with apprehension

and prefer to avoid it due to fears of potential risks (Walczuch et al., 2007). Such individuals may be reluctant to adopt new technologies unless they are convinced of their benefits and receive assurances that their concerns are addressed. Without sufficient evidence that the advantages outweigh the risks, these individuals may continue to avoid new technologies (Lai, 2008).

Technology Acceptance Model

Consumer reluctance to adopt and use new technological products has often resulted in less success for these products than businesses hoped. To address this issue, several models have been proposed to identify the factors that impact consumer acceptance or rejection of new technological innovations (Alkaya & Şahin, 2018). Among these, one of the most important models in this area is the Technology Acceptance Model, introduced by Davis, Bagozzi, and Warshaw in 1989. Originally, Davis and his friends developed the model to determine those aspects that were considered to be the most influential determinants of technology acceptance. This approach proposes that two crucial beliefs, namely, perceived usefulness and perceived ease of use, are critical in explaining attitudes toward new technologies of consumers (Plewa et al., 2012). Since its introduction, TAM been extensively tested and validated, consistently producing reliable results (Legris et al., 2003). The analysis section of this article will explore how perceived ease of use and perceived usefulness affect attitude towards using new technologies.

Perceived Usefulness: Davis (1989) describes perceived usefulness as, "the degree to which a person believes that using a particular system would enhance their performance in either their personal or professional life" (Surendran, 2012). A technology is considered highly useful when users believe that using it leads to better performance (Davis, 1989). Technologies that fail to assist users in their tasks or offer tangible benefits are unlikely to gain favorable acceptance (Plewa et al., 2012). Before committing to a new technology, some consumers may first seek feedback from other users or trusted sources. If they are convinced of the technology's benefits, they are expected to build a positive attitude toward using it (Gümüşsoy & Çalışır, 2009).

Perceived Ease of Use: Davis (1989) defines perceived ease of use as "the degree to which a person believes that using a particular system would be free from physical and mental effort" (Surendran, 2012). When all other factors remain the same, users tend to select an app that feels easier to use (Davis, 1989). As stated by Davis, perceived ease of use has a direct and significant impact on both perceived usefulness and attitudes toward using technology. As a result, when technology is perceived as easier to use, it can lead to improved performance in both work and personal life. Research by Devaraj et al. (2002) and Gefen et al. (2003) supports Davis's view by demonstrating that perceived ease of use influences perceived usefulness. Additionally, Cheng et al. (2005) shows that it affects attitudes toward using technology, thus reinforcing Davis's findings (Özer et al., 2010).

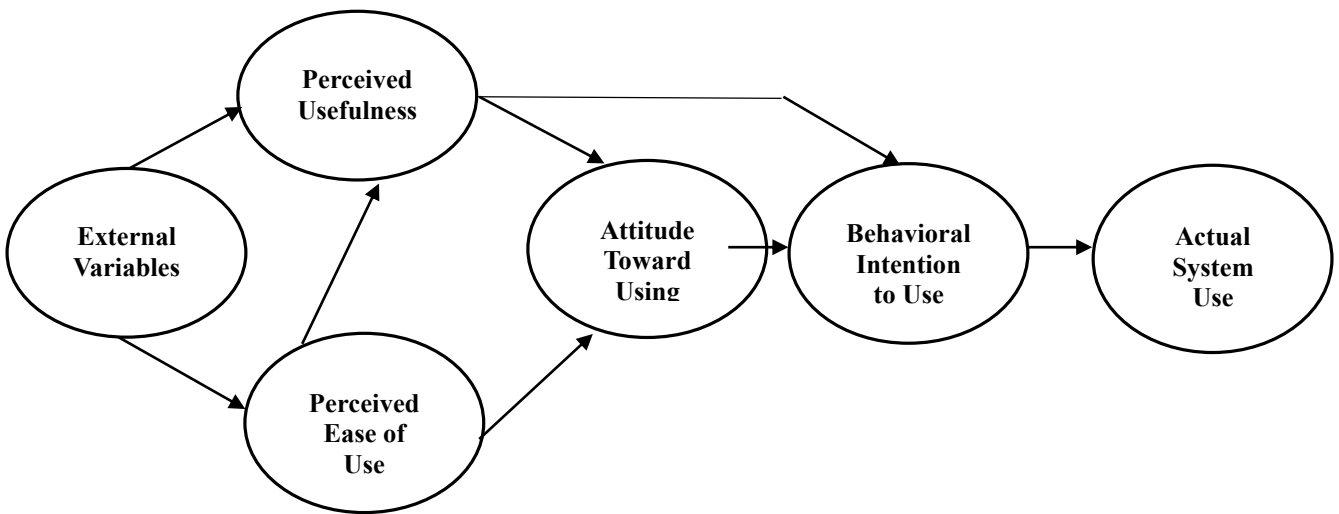
Attitudes Toward Using: Attitude is described as "a person's individual viewpoint or opinion towards another person, object, behavior, or policy, reflecting their own evaluations on a given topic" (Alkaya & Şahin, 2018). Attitudes toward using refers to the tendency to react positively or negatively to new technology and is a crucial factor influencing the intention to adopt it (Aras et al., 2015). Individuals may have varying attitudes toward performing the same behavior under similar conditions. A consumer with a positive attitude towards using a new technological product is more likely to use it

compared to another consumer with a negative attitude (Özer et al., 2010). According to Davis (1989), perceived usefulness and ease of use affect consumers' attitudes toward using a technology, thereby impacting their choice to use it (Koufaris, 2002). When consumers consider that a new technology will improve their performance (perceived usefulness) and that they can use it with minimal effort (perceived ease of use), they are more likely to have a positive attitude toward using these innovations. Therefore, to foster a positive attitude toward new technologies, it is essential that consumers perceive them as both beneficial and user-friendly (Şahin & Alkaya, 2017).

Model and Hypothesis

In this study, two different models were used to develop the conceptual model. The first model is the Technology Acceptance Model developed by Davis et al. in 1989, as shown in Figure 1. From this model, the variables perceived usefulness, perceived ease of use, and attitude toward using were taken. Additionally, variables such as optimism, innovativeness, discomfort, and insecurity from Parasuraman's (2000) Technology Readiness Model were included to enrich the conceptual model. These variables replaced the external variables from TAM. By combining elements from both models, the study's conceptual model was established, as shown in Figure 2.

Figure 1. Technology Acceptance Model (TAM)

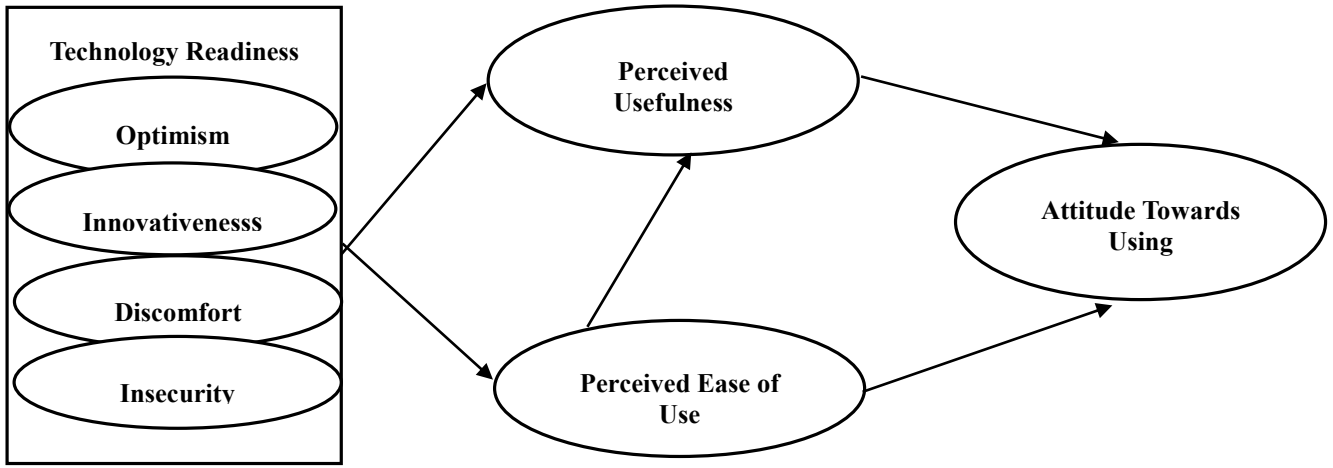


Source: Davis et al., (1989) User Acceptance of Computer Technology: A Comparison of Two Theoretical Models, *Management Science*, 35(8), 985.

The study population consists of smart device users over the age of 18 living in Istanbul. According to TUIK data, the population of Istanbul was reported to be 15,655,924 as of 2023 (TÜİK, 2023). A non-random convenience sampling method was employed in the sampling process due to its ease, speed, and cost-effectiveness (Yükselen, 2017). The scales used in the study are those associated with the respective models. The data collection was conducted via a survey. A questionnaire with 52

questions using a 5-point Likert scale was distributed to smart device users over the age of 18 in Istanbul. Participants selected the option that best represented their opinion, ranging from "Strongly Disagree" to "Strongly Agree". In the survey conducted for the research, question number 12 is designed as a "reverse-coded item". In total, 68 questionnaires were removed from the analysis due to missing or inaccurate responses. The final sample included 900 smart device users over the age of 18 in Istanbul.

Figure 2. Conceptual Model of the Research



In marketing literature, there is a wealth of research on consumer acceptance and resistance to technology across various sectors. Taylor et al. (2002) explored the insurance sector using Parasuraman's (2000) Technology Readiness Model, finding that optimism and innovativeness are the most significant factors influencing technology readiness.

Sönmez and Akgül (2015) investigated the relationship between university students' levels of technology readiness and their personality traits. After separately analyzing both aspects, they identified a significant relationship and influence between them.

Atilla et al. (2015) examined how individual technological readiness influences the adoption of a digital file management system among university hospital employees. The results indicated that participants who experienced less discomfort and insecurity regarding technology were more likely to use the system.

Chen and Li (2010) focused on the adoption of e-services by consumers, discovering that individuals with higher levels of optimism and innovativeness tended to interact with and consistently use these services.

Teo et al. (2011) utilized Davis's Technology Acceptance Model to analyze Turkish teacher candidates' intentions to use technology, discovering that approximately 51% of participants had intentions to do so.

Chuttur (2009) explored the origins, developments, and future prospects of the TAM, concluding that it remains a very popular model, with many continuing to focus on measuring and explaining system use.

Legris et al. (2003) reviewed 22 research articles employing three different variations of the TAM, suggesting that while the model is highly useful, it should be expanded to include variables that encompass human and social change processes.

Gyampah and Salam (2004) tested an extension of the TAM in the context of ERP implementation. Their study explored the effect of a belief system (shared beliefs among organizational participants and leaders about the benefits of a technology) and two commonly used elements in technology implementation (training and communication) on perceived usefulness, perceived ease of use, and attitudes towards use. The findings revealed that both training and communication influenced shared beliefs concerning benefits of the technology, which in turn, affected perceived usefulness, perceived ease of use, and attitude towards use.

Lule et al. (2012), in their research on the application of the Technology Acceptance Model to mobile banking adaptation in Kenya, found that perceived usefulness, perceived ease of use, perceived self-efficacy, and perceived credibility significantly influenced customers' adoption of mobile banking.

Building on the insights from this extensive body of research, the study proposes the hypotheses listed below:

H₁: Technology Readiness has a positive and significant effect on Perceived Usefulness.

H_{1a}: Optimism has a positive and significant effect on Perceived Usefulness.

H_{1b}: Innovativeness has a positive and significant effect on Perceived Usefulness.

H_{1c}: Discomfort has a negative and significant effect on Perceived Usefulness.

H_{1d}: Insecurity has a negative and significant effect on Perceived Usefulness.

H₂: Technology Readiness has a positive and significant effect on Perceived Ease of Use.

H_{2a}: Optimism has a positive and significant effect on Perceived Ease of Use.

H_{2b}: Innovativeness has a positive and significant effect on Perceived Ease of Use.

H_{2c}: Discomfort has a negative and significant effect on Perceived Ease of Use.

H_{2d}: Insecurity has a negative and significant effect on Perceived Ease of Use.

H₃: Perceived Ease of Use has a positive and significant effect on Perceived Usefulness.

H₄: Perceived Ease of Use has a positive and significant effect on Attitude Towards Using

H₅: Perceived Usefulness has a positive and significant effect on Attitude Towards Using

H₆: Perceived Usefulness has mediator effect on the relation between Perceived Ease of Use and Attitude Towards Using

Analysis and Findings

SPSS 20 statistical software was applied for analyzing the data collected from the participants. Additionally, the Process Macro, developed by Hayes (2013), an add-on for SPSS, was utilized to measure the mediation effects of the mediator variable. A multivariate regression analysis was conducted to test the mediation effect, and all results obtained were interpreted (Erkal, 2020). To assess the suitability of the dataset for factor analysis, the Kaiser-Meyer-Olkin (KMO) measure and the Total Variance Explained, which indicates the representational capacity of the factor structure, were used. The values for these metrics are as follows (Williams et al., 2010; Yaşlıoğlu, 2017):

Table 1: KMO & Total Variance Explained

| Variables | KMO | Variance % |
|------------------------|-------|------------|
| Optimism | - | 22.839 |
| Innovativeness | - | 17.403 |
| Discomfort | - | 11.530 |
| Insecurity | - | 8.303 |
| Technology Readiness | 0.901 | 60.075 |
| Perceived Usefulness | - | 40.784 |
| Perceived Ease of Use | - | 10.711 |
| Attitude Towards Using | - | 9.297 |
| Technology Acceptance | 0.879 | 60.791 |

The variables of the study were tested using exploratory factor analysis. As a consequence of the factor analysis, questions with factor loadings under 0.50 were removed from the analysis (Ceylan & Apan, 2014).

Table 2: Technology Readiness Factor Analysis Results

| Variables | Technology Readiness Survey Questions | Factors | | | |
|-----------|--|---------|---|---|---|
| | | 1 | 2 | 3 | 4 |
| Optimism | I tend to use the most up-to-date technology available. | 0.759 | | | |
| Optimism | I like the idea of working by using smart devices since I am not restricted by typical working hours (9:00 - 18:00). | 0.756 | | | |
| Optimism | Technology provides people with more control over their daily lives. | 0.743 | | | |
| Optimism | Learning to use smart devices is as rewarding as owning them. | 0.738 | | | |
| Optimism | Smart devices give me more freedom of movement | 0.729 | | | |
| Optimism | Products and services featuring the newest technologies offer far greater convenience than previous versions. | 0.722 | | | |
| Optimism | Technology helps me become more efficient in my profession. | 0.716 | | | |
| Optimism | I find new technologies exciting. | 0.689 | | | |
| Optimism | I like computer programs that enable me to organize my work according to my needs. | 0.683 | | | |

| | | | | | |
|----------------|--|--|-------|-------|-------|
| Innovativeness | I follow the most recent technological advancements in my field of interest. | | | | 0.843 |
| Innovativeness | I am generally able to understand new high-technological products and services without requiring assistance from others. | | | | 0.834 |
| Innovativeness | I enjoy figuring out high-tech smart devices. | | | | 0.826 |
| Innovativeness | I don't have trouble making the technological products I purchase work as I expect. | | | | 0.816 |
| Innovativeness | People around me seek my advice on new technologies. | | | | 0.792 |
| Discomfort | There are no user manuals for advanced technology products or services written in simple language. | | 0.764 | | |
| Discomfort | When I seek technical support from a high-technology provider, I often feel like I'm being given wrong information by someone more informed than myself. | | 0.760 | | |
| Discomfort | Technical support hotlines aren't very helpful to me due to the reason that they can't explain things in a way I understand. | | 0.756 | | |
| Discomfort | A variety of new technologies carry potential health or safety risks that only become apparent once people begin using them | | 0.744 | | |
| Discomfort | Caution is needed when relying on technology for important tasks instead of humans, as new technologies may fail or lose connection. | | 0.737 | | |
| Discomfort | I tend to choose a simpler model rather than one with additional features when buying a high-technology product or service. | | 0.726 | | |
| Discomfort | New technologies allow governments and businesses to access private information about individuals. | | 0.721 | | |
| Discomfort | Sometimes, I consider that high-tech smart devices are not designed for use by ordinary people. | | 0.717 | | |
| Insecurity | I am concerned that the information I share online could be viewed by others. | | | 0.809 | |
| Insecurity | I don't consider it safe to do business with a company that operates solely online. | | | 0.809 | |
| Insecurity | I do not find using a credit card online to be secure. | | | 0.792 | |
| Insecurity | I don't find any transactions over the internet to be secure. | | | 0.784 | |
| Insecurity | Any commercial transaction done electronically should be confirmed in writing later. | | | 0.741 | |
| Insecurity | I feel the need to check back on tasks automatically done by computers, thinking they may make mistakes. | | | 0.729 | |
| Insecurity | I can never be sure that the information I give via the internet or a smart device reaches the right people. | | | 0.703 | |

According to the factor analysis of technology readiness presented in Table 2, the conceptual model of the study was divided into four dimensions: optimism, innovativeness, discomfort, and insecurity. Seven questions with factor loadings lower than 0.50, were excluded from the scale.

Table 3: Perceived Usefulness-Perceived Ease of Use, Attitude Towards Using Factor Analysis Results

| Variables | Perceived Usefulness-Perceived Ease of Use, Attitude Towards Using Survey Questions | Factors | | |
|----------------------|---|---------|---|---|
| | | 1 | 2 | 3 |
| Perceived Usefulness | Using smart devices makes my job easier. | 0.771 | | |

| | | | | |
|------------------------|--|-------|-------|-------|
| Perceived Usefulness | Using smart devices allows me to increase my effectiveness at work. | 0.743 | | |
| Perceived Usefulness | Overall, I find smart devices useful for my work. | 0.737 | | |
| Perceived Usefulness | Using smart devices boosts my productivity. | 0.665 | | |
| Perceived Usefulness | Using smart devices helps me increase my performance at work. | 0.662 | | |
| Perceived Usefulness | Smart devices help me complete my tasks faster. | 0.628 | | |
| Perceived Ease of Use | I find it simple to remember how to perform tasks using smart devices | | 0.803 | |
| Perceived Ease of Use | I can easily achieve what I want by using smart devices. | | 0.766 | |
| Perceived Ease of Use | My interactions with smart devices are easy for me to understand. | | 0.728 | |
| Perceived Ease of Use | Smart devices assist me in completing my tasks. | | 0.690 | |
| Perceived Ease of Use | Overall, I find the use of smart devices easy. | | 0.681 | |
| Attitude Towards Using | Using smart devices are fun. | | | 0.776 |
| Attitude Towards Using | People around me are often impressed by my ability to use smart devices. | | | 0.767 |
| Attitude Towards Using | I enjoy using smart devices. | | | 0.741 |
| Attitude Towards Using | I don't mind giving up my habits to switch to a smart device with better features. | | | 0.715 |

According to the factor analysis results for perceived usefulness, perceived ease of use, and attitude towards using presented in Table 3, the conceptual model of the study was divided into three dimensions. One question, with a factor loading below 0.50, was removed from the scale.

The outcomes of the reliability analysis are shown in Table 4. According to these results, the variable with the lowest Cronbach's Alpha value is the Attitude Towards Using, with a value of 0.793, while the variable with the highest value is the Optimism, with a value of 0.897. In light of these evaluations, the reliability analysis results of the study's scale fall within acceptable and excellent ranges, indicating that the scale can be considered reliable.

Table 4: Scale Reliability Table

| Variables | Number of Questions | Cronbach's Alpha |
|----------------------|---------------------|------------------|
| Optimism | 9 | 0.897 |
| Innovativeness | 5 | 0.890 |
| Discomfort | 8 | 0.893 |
| Insecurity | 7 | 0.889 |
| Perceived Usefulness | 6 | 0.846 |

| | | |
|------------------------|-----------|--------------|
| Perceived Ease of Use | 5 | 0.849 |
| Attitude Towards Using | 4 | 0.793 |
| Total | 44 | 0.890 |

In this section, the research hypotheses were tested and interpreted using regression analysis. The R value in the regression table represents the correlation coefficient and indicates the strength and direction of the linear relationship between variables. A correlation coefficient between 0 and 0.3 signifies a weak relationship, between 0.3 and 0.7 signifies a moderate relationship, and between 0.7 and 1 signifies a strong relationship between the variables. The R² value in the table represents the coefficient of determination and shows the proportion of variation in one variable explained by another variable. In simple regression analysis, R² is considered, while in multiple regression analysis, the adjusted R² is used. The significance level (Sig.) indicated in the table shows whether the model is statistically significant, a Sig value less than 0.05 at a 95% confidence level indicates that the model is significant. The regression coefficient, shown as β in the table, indicates the effect of one variable on another, meaning the degree to which one-unit change in one variable positively or negatively affects the other variable (Yükselen, 2017; Gürbüz and Şahin, 2018). The VIF (Variance Inflation Factor) value shown in the table is calculated to assess the degree of multicollinearity, or the extent to which a variable is correlated with other independent variables (Büyüküysal & Öz, 2016). Based on Field's finding (2009), a VIF value below 10 and a tolerance value above 0.20 indicate that multicollinearity is not a significant concern (Uğurlu, 2017). If there is no significant relationship between the independent-dependent, mediator-dependent, or independent-mediator-dependent variables, it indicates that the mediator variable does not have a mediation effect. Conversely, if significant relationships are found among these variables, it suggests that the mediator variable either fully or partially mediates the relationship between the independent and dependent variables. Specifically, full mediation occurs when the inclusion of the mediator variable makes the relationship between the independent and dependent variables statistically insignificant. Partial mediation is indicated if the relationship remains significant but weakens after including the mediator variable (Yılmaz, 2018).

Table 5: Hypothesis Results

| Hypotheses | R | R ² | Adjusted R ² | β Value | P Value | Tolerance | VIF | Results |
|---|-------|----------------|-------------------------|---------------|---------|-----------|-------|---------------------|
| H₁ : Technology Readiness has a positive and significant effect on Perceived Usefulness | ----- | ----- | ----- | ----- | ----- | ----- | ----- | Partially Supported |
| H_{1a} : Optimism has a positive and significant effect on Perceived Usefulness. | 0.488 | 0.238 | 0.235 | 0.368 | 0.000 | 0.804 | 1.243 | Supported |
| H_{1b} : Innovativeness has a positive and significant effect on Perceived Usefulness. | 0.488 | 0.238 | 0.235 | 0.194 | 0.000 | 0.939 | 1.065 | Supported |

| | | | | | | | | |
|---|-------|-------|-------|--------|-------|-------|-------|---------------------|
| H1c: Discomfort has a negative and significant effect on Perceived Usefulness. | 0.488 | 0.238 | 0.235 | 0.061 | 0.056 | 0.842 | 1.187 | Not Supported |
| H1d: Insecurity has a negative and significant effect on Perceived Usefulness. | 0.488 | 0.238 | 0.235 | -0.066 | 0.029 | 0.919 | 1.089 | Supported |
| H2: Technology Readiness has a positive and significant effect on Perceived Ease of Use. | ----- | ----- | ----- | ----- | ----- | ----- | ----- | Partially Supported |
| H2a: Optimism has a positive and significant effect on Perceived Ease of Use. | 0.521 | 0.271 | 0.268 | 0.270 | 0.000 | 0.804 | 1.243 | Supported |
| H2b: Innovativeness has a positive and significant effect on Perceived Ease of Use. | 0.521 | 0.271 | 0.268 | 0.360 | 0.000 | 0.939 | 1.065 | Supported |
| H2c: Discomfort has a negative and significant effect on Perceived Ease of Use. | 0.521 | 0.271 | 0.268 | 0.051 | 0.102 | 0.842 | 1.187 | Not Supported |
| H2d: Insecurity has a negative and significant effect on Perceived Ease of Use. | 0.521 | 0.271 | 0.268 | -0.061 | 0.040 | 0.919 | 1.089 | Supported |
| H3: Perceived Ease of Use has a positive and significant effect on Perceived Usefulness. | 0.577 | 0.333 | 0.332 | 0.617 | 0.000 | ----- | ----- | Supported |
| H4: Perceived Ease of Use has a positive and significant effect on Attitude Towards Using. | 0.461 | 0.213 | 0.212 | 0.387 | 0.000 | ----- | ----- | Supported |
| H5: Perceived Usefulness has a positive and significant effect on Attitude Towards Using. | 0.448 | 0.201 | 0.200 | 0.352 | 0.000 | ----- | ----- | Supported |
| H6: Perceived Usefulness has mediator effect on the relation between Perceived Ease of Use Attitude Towards Using. | 0.512 | 0.262 | 0.261 | 0.255 | 0.000 | ----- | ----- | Partially Supported |

This study includes 14 hypotheses. According to the analysis results, 12 hypotheses were supported, while 2 were not supported. The beta values range from -0,066 to 0,617. The study includes a hypothesis involving mediation effect. It was found that perceived ease of use partially mediates the relationship between perceived usefulness and the dependent variable, attitude towards using.

Table 6 outlines the analysis results on the mediator effect of perceived usefulness in the relationship between perceived ease of use and attitude towards using. This analysis, conducted with the Process macro developed by Hayes and integrated into the SPSS statistical software, aimed to reevaluate the mediation effect. In a 95% confidence interval, mediation is considered significant if both the lower limit (BootLLCI) and the upper limit (BootULCI) of the bootstrap confidence interval are either entirely below or above zero (Erkan & Sop, 2018). The results shown in Table 6 indicate that the

BootLLCI and BootULCI values for the mediator variable are above zero within a 95% confidence interval, confirming the presence of a mediation effect. The influence of perceived ease of use on attitude towards using decreased from 0.39 to 0.26 when considering the perceived usefulness as a mediator. The significance level remained unchanged at 0.00. These findings reinforce the partial mediation effect of perceived usefulness, as detailed in Table 5.

Table 6: Mediator Effect of Perceived Ease of Use On the Relationship Between Perceived Usefulness and Attitude Towards Using, Analyzed Using the Process Macro

| Variables | Analysis | Attitude Towards Using |
|--|------------------|------------------------|
| Perceived Ease of Use | R ² | 0.21 |
| | P Value | 0.00 |
| | β Value | 0.39 |
| Mediator Effect of Perceived Usefulness On the Relationship Between Perceived Ease of Use and Attitude Towards Using | R ² | 0.26 |
| | P Value | 0.00 |
| | PU β Value | 0.26 |
| | BootLLCI | 0.09 |
| | BootULCI | 0.17 |

PU: Perceived Usefulness

Evaluation and Conclusion

This research intends to investigate the impact of tendencies of smart device users towards technological marketing innovations on their attitude towards using these innovations with the roles of perceived usefulness and perceived ease of use. It was initially concluded that optimism and innovativeness positively affect the perceived ease of use and perceived usefulness of technological innovations for smart device users.

Optimists are those people who believe that more good things than bad things will happen to them in their lives. This perspective, which focuses on positive outcomes and embraces risks, positively impacts the perceived ease of use and usefulness of technological innovations. Even if such individuals encounter negative experiences with technological innovations, their positive belief that they will not face the same issues with new technological products encourages them to continue taking risks. When they have positive experiences, they are likely to recommend the new technological product to others through word-of-mouth marketing.

Innovators are those who study and are among the first users of new technological innovations, waiting in long lines on the release day. Their enthusiasm for novelties, combined with the desire to be pioneers, positively impacts the perceived ease of use and usefulness of technological innovations. As early adopters, they identify product shortcomings, provide recommendations to manufacturers, and share their positive experiences with others, recommending the product to those around them.

Based on the responses from smart device users, it was found that feelings of insecurity have a negative impact on both perceived ease of use and perceived usefulness. Users have concerns about security vulnerabilities and privacy breaches associated with new technologies. They fear that their

personal data, such as computer passwords and credit card information, might be compromised or that internet connectivity might be disrupted while shopping online or performing important tasks. This insecurity negatively impacts the perceived ease of use and usefulness of technological innovations.

As indicated by the responses from smart device users, feelings of discomfort do not affect perceived ease of use and usefulness. Discomfort arises from the thought of losing control over new technology. Since current technological developments are mostly beneficial and do not yet pose significant threats to humanity, respondents do not experience substantial discomfort.

Parasuraman (2000) argued that a consumer with an optimistic or innovative disposition is likely to use new technological innovations, even if they feel somewhat insecure or uncomfortable about them. This study found that the positive effects of optimism and innovativeness on perceived usefulness and attitude towards using outweigh the negative effects of insecurity. The variable of technology readiness also positively affects perceived usefulness and ease of use. Moreover, perceived usefulness and ease of use positively impact attitude towards using.

Based on responses from smart device users in the survey, it can be seen that perceived usefulness has a mediator effect on the relation between perceived ease of use and attitude towards using. For example, if a newly produced state-of-the-art smartwatch is easy to use and provides many features that benefit the consumer, this will positively impact and increase the attitude towards using this technological product.

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